

Session: Recent Advances in Remote Sensing of Sea Ice
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ERS-1 RADAR INTERFEROMETRY OVER SEA ICE

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The fringes observed in repeat pass interferograms are expressions of surface relief and relative displacements. The limiting condition in the application of spaceborne radar interferometry to remote sensing of the sea ice cover is the ~~the~~ large magnitude of motion between repeat passes. The translation and rotation of ice floes tend to decorrelate the observations rendering radar interferometry ineffective. For our study, we have located three images in the high Arctic during a period when there was negligible motion between repeat observations. The fringes obtained from these images show a wealth of information about the sea ice cover which is important in sea ice mechanics and atmosphere-ice interactions. We can observe centimetric displacements between rigid ice floes compared to the lower resolution displacements derived from traditional ice feature tracking techniques. Ridges can be observed and their heights estimated if the interferometric baseline allows. We have observed ridges with heights greater than 4m. The variability in the phase measurements over an area provides an indication of the large scale roughness. We illustrate these observations with examples extracted from the interferograms formed from this set of ERS-1 SAR images.